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# CAUSES OF CONSUMPTION

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AN ETIOLOGICAL, STATISTICAL

## REPORT

-ON-

TUBERCULAR PULMONARY PHTHISIS.

-BY-

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## REPORT ON CONSUMPTION.

CONSUMPTION is the most important disease with which the medical profession and the public have to deal. It is much more fatal in proportion to the number of cases of it, with one or two comparatively unimportant exceptions, and it causes many more deaths than any other disease.

With the view of obtaining, for the *Sanitary Journal*, statistics and practical information bearing upon this malady, I, last year, had the list of questions below printed and distributed amongst practising physicians in Canada and the United States, abundant space being left for answers to the questions. Many hundreds were sent out, chiefly through the post office, and to physicians who had cases of the disease under treatment, and who had sent me their address (having been requested to do so through the courtesy of the medical press in both Canada and the United States) and expressed a willingness to answer the questions. I am pleased to report that a large proportion of them have been returned, fully and satisfactorily answered, with the exception that in some cases answers to two or three of the less important questions were omitted, this, however, detracting but very little from the value of the whole; while with some were returned a full history of two or three cases. The report is actually based upon the early history of over 250 cases of well-marked tubercular pulmonary consumption; the patients having been residents of various parts of Canada and the States of New York, Ohio, Michigan, Indiana, Illinois and Louisiana.

### QUESTIONS RELATIVE TO THE CAUSES OF TUBERCULAR PULMONARY PHTHISIS—SENT TO AND ANSWERED BY MEDICAL ATTENDANT.

 If physicians will be so good as to be very particular in obtaining and giving answers to these questions, the history of a few hundreds of cases thus obtained may prove of great value to both the profession and the public; without great care in answering the value will be greatly lessened.

 Please answer as fully as possible, and write plainly. In order to be satisfactory it will be necessary to fill in in the presence of the patient. Do so if possible.

Name of patient? Age?  
Male or Female? Married or not?



Height? Average weight in health?  
 Circumference of chest? Flat or round chest?  
 Color and shade of eyes?  
 If blue, light or dark shade?  
 Color and shade of hair?  
 Condition of teeth? Temperament?  
 Occupation? Place of birth?  
 How does length of trunk compare with length of limbs; *i.e.*, does patient seem tall or short when sitting?  
 What relatives, if any, have died of consumption?  
 Was either parent intemperate in use of alcoholic spirits?  
 Did either use tobacco?  
 Was either particularly delicate or weakly?

~~Please~~ Please bear in mind that the following questions relate to the time a year or two previous to the first symptoms of the disease in the patient.

Place of abode a year or two previous to attack?  
 Was this place high and dry, or moderately so, or low or damp?  
 Nature of soil?  
 Face of country—flat or rolling?  
 Was ague or remittent fever common in locality?  
 General habits of patient two or three years previous to attack?  
 Patient then strong and vigorous or weakly?  
 Any symptoms of indigestion or dyspepsia?  
 Bowels usually regular or constipated?  
 How much average time spent out of doors?  
 At other times—in house, or shop, or where?  
 Size of bedroom, about?  
 Did patient usually sleep alone?  
 What ventilation of bedroom at night, if any, as open window or door?  
 Usual time of rising?  
 Did patient habitually breathe through nostrils only, or through mouth also?  
 Nature and sorts of food, usually, and of drinks used?  
 Large or small eater?  
 Much or little fats (including butter) used?  
 Much pastry used? or pork?  
 Was flannel worn next skin?  
 Did patient habitually use any form of bath, summer and winter?  
 Ever used tobacco? How much? How? How long?  
 Ever used alcoholic spirits, and if so, to what extent?  
 If female, how many children, if any, has she borne, and *nursed*?  
 Any special uterine trouble?  
 Had patient been much in contact with another suffering from consumption?  
 If so, wife or husband? And how long?  
 Had patient used milk from an old or diseased cow?  
 How did attack commence, as by severe cold, or gradually?  
 Had patient small pox? Scarlet fever? Measles?  
 Physician please make below any remarks he deems desirable or pertinent; and return, addressed to Dr. Playter, Toronto, Canada.

THE AGE of the patients varied from 14 to 48 years, the average age being 27 years. Much the larger proportion (about 37 per cent. of the totals) died at about the age of 25 or 26 years.

SEX.—Forty-six per cent. were males, and 54 per cent. were females.

OF MARRIED persons there were 28 per cent., and unmarried 72 per cent.

THE HEIGHT varied from 4 feet 11 inches to 6 feet; the average of the whole being 5 feet 5½ inches.

THE WEIGHT varied from 79 pounds to 171 pounds; the average being 131½ pounds.

THE CIRCUMFERENCE OF THE CHEST varied from 25 to 36 inches, and averaged 31½ inches.

IN FORM, THE CHEST was reported as flat in about 50 per cent. of the cases; as medium in over 25 per cent., and round in 17 per cent.

THE EYES were "light blue" in 55 per cent. of the cases, dark blue in 16 per cent.; the remainder being reported as "brown," "dark," or "grey," or color not given.

THE HAIR was "light" or "light brown" in 54 per cent. of the cases; in the remainder it was "auburn," "brown" "dark brown," or "almost black."

THE TEETH were reported as "good" in 46 per cent.; and the remainder as "mostly bad," "bad" or "gone."

TEMPERAMENT.—"Nervous" temperament was reported in 38 per cent. of the cases; "sanguine" in 17 per cent.; the remainder, when given, nervo-lymphatic and nervo-bilious. Hence the nervous temperament largely prevailed.

OCCUPATION.—In over 66 per cent. of the cases the patient had been engaged in an in-door, sedentary occupation—sewing, housework, writing, studying, book-keeping, and the various lighter trades; a few had been ladies of leisure, with no occupation; only a small proportion had been engaged in farming or any active out-door work.

THE PROPORTIONATE LENGTH OF LIMB, as compared with that of the trunk, varied. Less than 20 per cent. appeared "short" when sitting; indicating a proportionately short trunk and long lower extremities. About 45 per cent. appeared "tall" when sitting; indicating a trunk long in proportion to the whole body. The remainder reported upon were "fairly proportioned," etc., in this regard.

HEREDITY.—In over 45 per cent. of the cases no relatives had died of the disease—so reported, and so far as known. In 53 per cent. relatives had died of it; in 35 per cent. of these, near relatives—father, mother, brother or brothers, sister or sisters; and in 18 per cent., grandfather or grandmother, uncle or aunt, or cousin. In only about 36 per cent. had actual ancestors—parents or grandparents, from whom alone it could be inherited, died of the disease.

**PARENTAGE.**—In over 70 per cent. the parents of the patients were said not to have been "particularly delicate" or weakly—*i. e.*, neither of them; and in about 17 per cent. of these they had been "robust," "healthy," etc. In about 19 per cent. both parents had been "sickly," "always complaining," "weakly," or not strong; and in 10 per cent. either father or mother had been likewise.

In 10 per cent. the father only had been intemperate in the use of alcoholic spirits; in 11 per cent. the father had used these to excess only "occasionally" or "not often"; in the remainder neither parent had been intemperate in this way. The father only had used tobacco in 37 per cent. of the cases; in 8 per cent., both father and mother had used it; in nearly all the others, neither parent had used it.

**LOCALITY.**—In about 40 per cent. of the cases the locality in which the individual had resided for a year or two previous to the appearance of the disease was "low and damp"; and ague and remittent fever had been common. In 26 per cent. more the place of abode had been near mill pond, lake, river, or sea shore; and other 8 per cent. were reported as having lived over "damp" or "wet" cellars; with malarial fevers "occasional." The soil for the most part in the 75 per cent. (about) of the cases was "clay," "loam," or "gravel and clay." In the remaining 25 per cent. the locality was either "high and dry" or "moderately" so, and the soil for the most part "sandy" or "gravelly."

**THE GENERAL HABITS** of the patients previous to the attack had been in all but about 10 per cent., "good," "temperate," "regular," careful," etc. In the 10 per cent. they had been "moderately good," "not bad," "not good," "drank at times," etc.

**GENERAL HEALTH, ETC., PREVIOUS.**—About 80 per cent. were reported as having been previous to the appearance of the disease "strong" or "vigorous," or "fairly so," etc. About one-half of the remainder had been suffering from some other slight ailment, and the other half had been "weakly" or "delicate" or "not strong." It may be here observed that though those reported as having been strong or vigorous, may have been for the most part in good or fair health, the vigor in most cases was probably more apparent than real.

**INDIGESTION OR DYSPEPSIA** had occurred occasionally or periodically previous to attack in 28 per cent. of the cases; while in nearly 70 per cent. there had been no such symptoms, or none marked or noticeable.

**BOWELS** had been regular or fairly so in 63 per cent. of the

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cases; constipated in 26 per cent.; and "irregular" or "relaxed" in about 10 per cent.

THE TIME SPENT IN THE OPEN AIR was reported as from "but little" to 2, 4 and 6 hours, in nearly all cases; the remainder of the time having been passed in house, shop, office, etc. Even the few who had been engaged in outdoor work had not it appears spent a large proportion of their time out of doors.

THE BED-ROOMS in all except a few cases had been "small" or "medium" in size, varying from 8 by 10 feet to 10 by 12 feet, and a few, 12 by 14 feet; giving an average area of from 600 to 1,000 or 1,500 cubic feet. In only 36 per cent. of the cases had the patient previously slept alone.

VENTILATION OF BED-ROOM.—There had been no means whatever of ventilating the bed-rooms in any of the cases other than that of opening a door or window. In many cases the room door had been left open at night, and in a few the window, but probably only in the warm weather.

TIME OF RISING.—They were nearly all it appears rather early risers, rising from bed at from 5 to 7 o'clock, only a few at 8 or 9 o'clock.

BREATHING THROUGH NOSTRILS—About 33 per cent. were reported as having breathed "through nostrils"; and the half of these through nostrils "only." Over 60 per cent. breathed through both nostrils and mouth. Nearly 10 per cent. of these though had had nasal catarrh or like trouble and probably breathed through mouth only or chiefly.

DIET.—"Very little" or "little meat" had been eaten by 30 per cent. of the cases. About 50 per cent. had used "ordinary diet," "bread," "pork," "pie," "vegetables," etc. Only a few it appears had been used to a "good" or "nutritious" diet—good wholesome food.

IN QUANTITY OF FOOD, over 60 per cent. had been "small eaters"; 11 per cent. of these were "very small" or "delicate" eaters. Nearly 30 per cent. had been "moderate eaters"; and but very few had been "good" eaters; not one was reported as "large" eater.

"NOT MUCH FATS" used, or "very little" or "little," "except butter," was reported of nearly all; a few had used "considerable" fats. About 50 per cent. had been "fond of" or used "considerable" butter.

MUCH PASTRY had been used in more than half the cases; by 37 per cent. "not much" had been used, or "very little"; by the remainder a moderate quantity was used.



NOT MUCH PORK had been used in over 60 per cent. ; a "good deal" or "great deal" or "much" had been used by nearly 30 per cent. ; a few never ate it.

FLANNEL WAS NOT WORN next the skin in over 53 per cent. of the cases ; in 28 per cent. it was worn "in winter." In 17 per cent. "yes" was the answer to the question, indicating that it had been worn by this proportion probably constantly.

HABITUAL BATH of any form.—"No" was the answer to this question in 42 per cent. of the cases, who seemingly did not bathe at all, or hardly ever, excepting of course the face and extremities. 38 per cent. bathed "occasionally," "irregularly," or "in summer." Less than 20 per cent. bathed "habitually" or "frequently," or were said to be "very cleanly."

TOBACCO USED.—Of the males, 60 per cent. had used this weed, for the most part seemingly to excess, *i. e.*, a "good deal," "smoked and chewed," etc. ; the remainder reported had not used it. No females were reported as having used it.

ALCOHOLIC SPIRITS.—In about 43 per cent. of the males no alcoholic spirits had been used. In 39 per cent. they had used such "occasionally," in "small quantity," or "not to excess"; 16 per cent. had used more, over half of whom had used "too much," etc. Not any of the females had been in the habit of using alcohol, except a very few who had used lager beer.

CONTAGION.—In about 28 per cent. of the cases the patients had been more or less with relatives who had been suffering from the disease—attending, nursing or sleeping with them ; and in about 70 per cent. they had not been with any such, nor exposed to the disease in any way so far as known. None were known to have used infected milk.

DISEASE COMMENCED in 61 per cent. of the cases seemingly after a "severe cold," "exposure to cold," or "repeated colds"; in 8 per cent. the cold was taken "in summer." In 28 per cent. the disease commenced "gradually," patient failing in health slowly at first. In the remainder for the most part the disease seemed to have commenced quite suddenly, as after great prostration and weakness from loss of blood—wounds or miscarriage, or after debilitating disease.

SMALL-POX.—Not one was reported as having had this disease. In 6 per cent. of the cases the answer to this enquiry was omitted ; in the others, "no" was the answer given.

SCARLET FEVER.—Nearly one-half had had this malady ; 36 per cent. were reported not to have had it ; and in the remainder it was uncertain. or the question was not answered.

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MEASLES.—73 per cent. had had this disease ; 9 per cent. had not had it, or were so reported ; and in the other cases it was uncertain, or the question was unanswered.

#### DEDUCTIONS.

The foregoing report or analysis of cases agrees with what statistics in Ontario and most other countries have taught us, in so far as that consumption is much more fatal in the third decenniad of life,—between the ages of 20 and 30 years, than in any other decennial period—when, or soon after, it appears, the period of light-hearted, irresponsible youth has passed away, and the stern realities and responsibilities of life have to be faced and assumed ; and, also, that more females than males die of the disease. I had not observed any statistics showing that much the larger proportion of those who die of consumption are unmarried. Of the cases herein reported, not much short of three-fourths had not entered the married state. Though celibacy in these cases may have had but little connection with cause and effect, it is not improbable that marriage, in certain conditions and certain stages of the disease, is unfavorable to the development of consumption, and though physicians usually advise those who are predisposed to the disease not to marry, I have known young persons with well-marked symptoms of incipient phthisis to marry and to improve in health, and, to all appearances, entirely recover, the further progress of the disease seemingly having been entirely checked thereby.

It appears from the report, too, that any special influence or matter of a direct or specific hereditary character, as a factor in the causation of consumption in adults, or even in youths, is not of such constancy and importance as has been commonly supposed. In only little more than one-half (53 per cent.) had any relatives been known to have died of the disease ; and in not much more than one-third (36 per cent.) had any ancestors—parents or grandparents—from whom alone it could have been inherited, died of it. More than this in favor of heredity could doubtless be said of scarlet fever and measles. But, in so far as configuration and structure of the body, and the relation, and the relative size, vigor, and of different organs to each other are influenced by parentage, hereditary influence becomes a very important causative factor. Indeed, heredity probably has no direct influence whatever at the periods of life above mentioned other than in this way.

Man is made up of the characteristics and peculiarities, physical and mental and moral, of his ancestors ; more largely of those of his parents than of his grandparents. In organic life like produces like,

and form, general structure, features, are, by the laws of life, man's sure inheritance—subject, to be sure, to the influences of the conditions and circumstances by which he is surrounded. We can, therefore, but expect and look for constitutional or organic defects to be transmitted from parents to offspring.

One of the most marked features, and perhaps the most important one, brought out in the analysis of the cases, is the evidence that those who die of the disease under consideration have a small pulmonary capacity—a small, contracted chest. This is shown not only in the average of the cases, but in every case; in not one did the circumference of the chest even approximate that of a well developed individual of the same height and weight.

According to the best authorities the circumference of the chest around or on a level with the nipples should be, for good development, equal to one-half the height, plus one-fifteenth the height, of the individual. The circumference of the chest, therefore, of one whose stature is 5 feet  $5\frac{1}{2}$  inches—the average height of the cases above reported upon—should be, according to that, at least 37 inches; whereas the average circumference of the chest in these cases was only  $31\frac{1}{2}$  inches, or only about five-sixths of that demanded by health and good natural development.

In about half the cases the chest was flat as well as small in circumference—a form giving still less capacity than a round chest with the same circumference. It may be fairly assumed that the average depth or length of this cavity in these cases was not greater, if so great, as the depth of it in well-developed persons. True, in the larger proportion of cases the trunk seemed proportionately long, but most likely this length was owing to a long abdominal cavity, as in most of the cases the function of digestion appears to have been well performed, indicating well developed digestive organs.

Now, as the size of the lungs is in exact relative proportion to the size of the chest, the lungs with the heart and its large trunk vessels just filling the cavity, and though it is possible that small lungs may be more highly organized than larger ones, as doubtless is the case with other organs, especially the brain—that the air cells in the smaller lungs may be, relatively, more numerous than in the larger ones, and so give a relatively greater respiratory surface, we have no evidence that this is the case, and though this condition might prevail to a certain and limited extent, there was, doubtless, in all these cases a great want of capacity for the purposes of carrying on the important function of respiration—that by which oxygen is taken into the blood and the excrete or waste carbonic acid is

given out. There would be, consequently, in such circumstances, besides want of stamina, a tendency to accumulations in the blood and other fluids of the body of waste, used-up matters, and frequently probably, too, of unassimilated though digested food.

Furthermore, they had nearly all been small or moderate eaters, and had used but little fatty food except butter (most healthy people use besides butter a good deal of fats); they could not, in fact, consume enough oxygen to utilize the digested products of a generous or full diet, especially that containing much carbonaceous matter. They had, consequently, no natural desire for more than a small or very moderate quantity of food. But few of them, as we find, suffered from indigestion; they could, for the most part, readily digest all the system could utilize with its small respiratory capacity—all there was a natural inclination for. It is frequently the case that persons predisposed in this way to pulmonary consumption have a desire for and will digest very indigestible foods, such as pastry and hot bread.

Consumption is, doubtless, a contagious disease, though the evidence herein of this is not strong. Only a few comparatively (28 per cent.) had been known to be much and directly exposed to the disease, nursing and sleeping with friends suffering from it. Why, it may be asked, should persons with small lungs most readily and usually take the disease and fall victims to it? Many more people, we cannot doubt, take into their bodies the germs of consumption, the bacilli which give rise to the symptoms of the disease, than who manifest these symptoms and become consumptives; just as, doubtless, many more take in the germs of other contagious diseases than manifest any marked symptoms of the same. Besides the exciting cause of a disease, there must be, before the disease can be developed, a predisposing cause—the seed must have favorable conditions for its development and multiplication. It is very generally believed, and appears very evident, that such diseases as typhoid fever and diphtheria arise only when there have been insanitary conditions and environments of some sort. In a healthy, vigorous, clean constitution the germs are harmless comparatively, and are probably soon expelled from the body by the excretory organs. The bacilli of consumption in the human organism must meet with favorable soil and favorable conditions in which to propagate before they can give rise to this fatal malady. These conditions arise, secondarily, through inharmonious and defective constitutional organic action and want of vigor, coupled with, very likely, accumulations in the body of detrital matters; and, primarily, from want of capacity for the perfect performance of the respiratory function—from too small lungs.



However this may be, we have before us the fact that in every one of the cases of pulmonary consumption herein reported upon, the lungs were much smaller than the average of a well-developed human organism; a fact bearing the strongest evidence that all sufferers from the disease have small lungs—small respiratory capacity. And the one means which will best tend to prevent the development of the disease in those thus predisposed to it is apparent enough: it is that of increasing, in early life, by judicious physical exercise, the size and capacity of the respiratory organs. Empirics, long ago, in treating cases of incipient consumption, practised thus, as I have just indicated—aimed at increasing the lung capacity.

I shall here take the liberty of drawing attention to the desirability of physicians taking into consideration the respiratory capacity of patients suffering from tubercular phthisis before prescribing a full or too carbonaceous diet

An individual 5 feet  $5\frac{1}{2}$  inches in height ought to weigh at least 140 pounds; the average weight of the cases reported upon was only 133 $\frac{1}{2}$  pounds. The weight is, however, very liable to vary considerably in fair health, and the lighter weight, though indicating defective powers of nutrition, is a less marked feature and of less importance than the capacity of the chest.

Another marked feature in the analysis of cases herein, is that in nearly three-fourths of the cases the patient had resided in a locality favoring a humid, cool atmosphere: confirming the results of the investigations many years ago of Drs. Buchanan and Bowditch, that dampness of soil, in a large measure if not wholly by giving rise to dampness of atmosphere, favored the development of consumption. A humid atmosphere may do this chiefly by interfering more or less with the healthy action of the skin, which organ has a limited respiratory function—*i. e.*, by retarding or obstructing the perspirations.

Then furthermore, over 80 per cent. did not wear flannel next the skin habitually or constantly; nor did about the same proportion attend to the functions of the skin by keeping it clean, healthy and active by means of habitual bathing.

Finally, in nearly all the cases, but little, instead of a great deal, of time had been spent in the open air, where the respiratory function is as a rule most perfectly performed; and most of the patients had occupied small, unventilated bed-rooms and slept two at least in a bed or room, thus still further interfering with and obstructing this important function.

The light blue eyes and light hair in the majority of the cases were indicative of want of stamina and vigor. The general habits in much the largest proportion of the cases had been good or fair—not bad or irregular: as a rule those of bad habits are (at first) healthy and strong. The nervous temperament had largely prevailed; indicating an average of wisdom or common sense.

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